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sun microsystems

READ THIS FIRST
SunOS 4.0.3

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Contents

Introduction 1

About This Document 1

Getting Help 3

Sun Hotline Numbers 4

New Release Features 5

Software Compatibility 5
New Sun Systems 5
New Hardware 6
New Software 6
Boot PROM Issues 7

Known Problems 7
Device Drivers 7
Diagnostics 7
Documentation 7
Graphics 8
Installation 8
Mount Point Definition 9
Kernel 9
Library 10
Network 10
SunLink 10
SunView 11
Utilities 11
Sunupgrade 11
Security Hole 12
Changing the Sun Logo 13

Distribution Tape Layout 15

Configuring the System Logging Daemon 17

SunCGI and SunCore End Life 17

Documentation Errata 18

Read This First

READ THIS FIRST
SunOS 4.0.3

Introduction

SunOS™ 4.0.3 provides support for new hardware, fixes for bugs found in earlier releases, and new software features. This document supplements the following manuals, which are packed in the "mini-box" of 4.0.3 release documentation:

- The *SunOS 4.0.3 Release Manual (800-3815-11)* describes the new hardware and software and critical bug fixes.
- *Installing the SunOS 4.0.3* explains how to install SunOS 4.0.3, for both full installations and upgrades to existing systems.

> **Note:** An upgrade installs *only* the software needed to upgrade an existing 4.0 (or later) installation to SunOS 4.0.3, while a full installation installs *all* software. Your SunOS 4.0.3 tapes support either a full system installation or an upgrade (but not both). (The Upgrade set is labeled "Upgrade.")

You should read this *Software READ THIS FIRST* before turning to *Installing the SunOS 4.0.3*.

About This Document

This document contains the following sections:

- **Getting Help**
  Describes what to do if you have problems installing or using SunOS 4.0.3.
- **New Release Features**
  Highlights new software features and supported hardware.
- **Known Problems**
  Lists problems that are known to exist in this release; provides workaround solutions wherever possible.
- **Distribution Tape Layout**
  Describes how to produce a list of the files on the upgrade or full-install SunOS 4.0.3 tapes.
- **Configuring the System Logging Daemon**
  Clarifies issues surrounding this post-installation issue.

- **SunCGI and SunCore End of Life**

  Discusses the phasing out of SunCGI and SunCore, and associated support questions.

- **Documentation Errata**

  Provides vital change pages and addenda to the Docubox. It is essential to remove the specified pages in your Docubox, and replace them with the pages appended to this document. Unless you do this, you will be without information critical to booting your system properly.

Getting Help

If you have problems installing or using SunOS 4.0.3, call Sun Microsystems® at 1-800-USA-4SUN (1-800-872-4786) or at the appropriate hotline number (see the next section). You will be asked for the following information:

- Your name and electronic mail address (if any)
- Your company name, address, and phone number
- The model and serial number of your workstation
- The release number of your Sun software (for example, 4.0.3). You can display the contents of the "message-of-the-day" file (`/etc/motd`) to check the number as follows:

```
denmark->49: cat /etc/motd
SunOS Release 4.0.3 (GENERIC) #1: Mon MAY 15 15:21:41 PDT 1989
```

- Any information that may help to diagnose the problem.

If you prefer, you can direct questions by electronic mail to `sun!hotline`. Be sure to include the same information as above.

Call your sales representative if you have questions about Sun support services or your shipment.

Sun Hotline Numbers

Sun customers throughout the world provide service hotlines for both software-support and hardware-support questions. The service hotlines are listed below. If your country is not shown in the table, please phone your local Sun sales office.

Country	*Service Region*	*Hotline Number*
Australia	Sun Australia	(2) 436-4699
Canada	*Central Region:*	
	Ottawa	(613) 723-8112
	Ontario	(800) 263-1680 or (416) 477-6745
	Eastern Region:	
	New Brunswick, Newfoundland, Novia Scotia, Prince Edward Island, Quebec	(800) 361-1554 or (514) 738-4885
	Praries Region:	
	Saskatchewan, Manitoba, Alberta	(800) 661-9256 or (403) 262-6722
	Vancouver:	
	British Columbia	(800) 663-0440 or (604) 684-4120
France	Paris Sun Microsystems France SA	1 4630 0231
Germany	Munich Sun Microsystems GmbH	89/95094-321
Hong Kong	Sun Hong Kong	(5) 865-1688
Japan	C. Itoh Data Systems	(3) 497-4746
	Nihon Sun	(3) 221-7021
The Netherlands	Soest Sun Microsystems Nederland BV	2155 24888
Sweden	Solna Sun Microsystems AB	8 764 78 10
Switzerland	Zurich Sun Microsystems (Schweiz) AG	1 828 9555
United Kingdom	*European Customer Service:*	
	Surrey Sun Microsystems UK Ltd	276 50183
	Albany Park Sun Microsystems UK Ltd	0276 691052
United States	All, including Puerto Rico	1-800-USA-4-SUN (1-800-872-4786)
Countries Not Listed	All countries outside the USA, Europe, and Northern Africa	(415) 496-6119

New Release Features

This section highlights some of the new features in SunOS 4.0.3. See the *SunOS 4.0.3 Release Manual* for more detailed discussions of these features (and others).

Software Compatibility

SunOS 4.0.3 obsoletes and supersedes the following:

- SunOS 4.0.1
- 4.0 SCSI/ALM-2 Patch Tape
- 7053 (VME/SMD) Patch Tape
- FPU2 Patch Tape

New Sun Systems

SunOS 4.0.3 supports several new Sun systems. These are:

- Sun 3/80 and Sun-3/400 series systems, Motorola 68030-based additions to the Sun-3 family that are summarized in Table 1.

Table 1 *New 68030-Based Systems (**sun3x** Architecture) in SunOS 4.0.3*

SYSTEM	*DESCRIPTION*
Sun-3/80	A desktop system based on the 20-MHz Motorola processor. Options include integrated SCSI hard disk and 3-1/2″ floppy-disk drive.
Sun-3/470 & Sun-3/480	A deskside workstation (-3/470) and server (-3/480) based on the 33-MHz Motorola processor. Up to 1.3 gigabytes of SCSI disk storage. Multiple SMD drives (up to 16 for the Sun-3/480 server). 60-megabyte or 150-megabyte 1/4″ tape drive.

There are no differences at the user-application level. *Sun-3 user applications run without change on any Sun-3/400 series or Sun-3/80 system.*

- The SPARCstation 330, a member of the new SPARCsystem 300 family of high-performance systems. Features include multiple VME slots for memory expansion, up to 1.2 gigabytes of SCSI disk storage, and a 150-megabyte 1/4″ tape drive.

Supported Media for the 150-Megabyte Tape Drive

The 150-megabyte 1/4″ tape drive can read from or write to the 3M-DC6150 (formerly the 3M-DC600XTD) tape cartridge, Sun Part Number 370-1203-01, and *read* from *but not write to* tapes that were written on a 60-megabyte drive, such as the 3M-DC300XL/P tape cartridge or the DEI Series II Silver tape cartridge, Sun Part Number 370-0543.

New Hardware

In addition to the new system products (see the preceding section), new hardware in SunOS Release 4.0.3 includes:

- The FPU2 floating-point hardware unit for selected Sun-4 systems and the FPA+, a high-performance floating-point accelerator for the Sun-3/470 and Sun-3/480.
- The CG6 graphics accelerator and the CG8 graphics board.
- SunDials, an image-manipulation device for Sun-3, Sun-4, and Sun-386i workstations.
- A 688-megabyte SMD disk packaged in the new Storage Pedestal Upgrade Drive (or SPUD). It is the same physical size as the existing Mass Storage Pedestal, but provides 2.5 times more storage.

New Software

New software in SunOS Release 4.0.3 includes:

- GPSI (Graphics Processor Software Interface) enhancements, bringing features such as picking and depth-cued vectors to the Sun family of graphics processors.
- The `sundiag` program, a SunView-based diagnostic tool you can use to test and exercise system devices and peripherals.
- New `mt` (magnetic-tape device) command options for faster tape positioning.

  bsfm Backspace *n* file marks.
  asf Absolute-space to *count* file mark.
  eom Space to the end of recorded media (SCSI only).

  Note that 1/2″ tape drives with Tapemaster or Xylogics controllers emulate the **asf** by a rewind followed by an appropriate forward-skip.
- Preconfigured small kernels to eliminate the extra steps needed to customize the kernel on many smaller systems.

Boot PROM Issues

As of Revision 3.0 the Sun 3/2x0 Boot PROM does not support the Tapemaster 1/2" Tape controller. Additionally, the Sun 4/2x0 Boot PROMs do not support the Tapemaster.

Known Problems

This section discusses problems known to exist in SunOS Release 4.0.3.

Device Drivers

The **sun3** architecture permits a device at `0xff0000` in vme16d16 space, despite the fact that vme16d16 only supports a 16-bit offset. Such devices will not work on **sun3x** architecture, which enforces VME-addressing rules more strictly.

There is additional **sun3x** driver information in Chapter 4 of the *SunOS 4.0.3 Release Manual.*

Diagnostics

- Sundiag sometimes makes an attempt to access a `/dev/sd1a` device when there is no `sd1` disk. The system hangs as a result. (This problem was observed on a SPARCstation 330.)
- Running Sundiag in verbose mode can cause the system to hang.

  Workaround: Until further notice, do not run Sundiag in verbose mode.
- You may occasionally see a message such as the following:

  `bad packet size 56 should be 16, from` *<internet address>*

  The condition is harmless and will be fixed in a later release. (The machine on which this problem was noted had received a concatenation of two packets.)
- While testing under Sundiag 1.1, `vmem`-compare errors occur randomly over time.
- On a Sun-3/80, the `cgsix0` test sometimes causes a "watchdog reset!" system crash.
- The FPU fails the `linpack` test, but does not update the error log or status.
- On a Sun-4/330, you sometimes receive the following error:

```
sd6: write sd6: sd timer: I/O request time out
```

Documentation

There are four problems associated with documentation flagged in the following paragraphs, the first two having to do with installation, the last two relating to the Release Manual.

At the end of this RTF, you will find change pages for *Installing the SunOS, 4.0.3*. You must replace these pages in your copy of the SunInstall manual, or you will be unable to install the operating system. See page 18 in this document for further information.

A number of pre- and post-installation are discussed in sections 2.4 and 2.5 of the Release Manual. Please read them before installing SunOS 4.0.3.

At the end of this RTF, you will find change pages for *SunOS 4.0.3 Release Manual (800-3815-11)*. You should replace the pages in the Release manual with these pages. See page 18 in this document for further information.

Due to typesetting errors, Appendix A in the *SunOS 4.0.3 Release Manual* is confusingly organized. Pages 121 through 126 of Appendix A clarify issues in the Release Manual. Pages 127 and 128 clarify the SunInstall manual.

Graphics

- **CG6**: The line and polygon drawing algorithms of the CG6 framebuffer differ slightly from other framebuffer and memory pixrects. This affects applications that expect that the identical pixels are drawn on both the CG6 screen pixrect and a memory-retained pixrect.
- **CG8**: Several graphics demonstration programs do not work.
- **CG8**: The retained canvas does not recognize 24-bit color.
- **CG8**: Eight-bit color applications are not supported.
- **GP**: Clipping windows are incorrectly clipped if specified outside of the screen boundaries.
- **GP2**: the circle marker primitives (`1GP1_MARKER_CIRC`, `GP1_MARKER_FILL_CIRC`) are not Z-buffered even though the hidden surface flag is set to `ZBMARKERS`.
- **GP2**: The two-dimensional circle marker primitives (`GP1_MARKER_CIRC`, `GP1_MARKER_FILL_CIRC`) ignore the raster op (as set with `GP1_SET_ROP`) and always use `PIX_SRC` instead.

Installation

- You must edit the `/usr/etc/install/script/fix_rcboot` script as shown below in order to use `suninstall` to install a gateway server. (Use `ed` to make the change in single-user mode.)

  Change:

  ```
  hostname=`hostname`
  ```

  To:

  ```
  hostname=\`hostname\`
  ```

- If you are installing a YP slave gateway server, you must do the following:

  1. Edit `/etc/rc.single` and comment out the following lines:

  ```
  hostname=`hostname`
  /etc/ifconfig ie1 $hostname-gw -trailers up
  ```

2. After the line

```
ifconfig ec0 `hostname` netmask +
```

in the `/etc/rc.local` file, add the following lines:

```
hostname=`hostname`
ifconfig ie1 $hostname-gw -trailers up netmask +
```

Mount Point Definition

When defining a mount point on the Disk Form in SunInstall, remember that the number of characters defining the mount point can be no greater than 24. If the mount point definition character number is 25 or greater, you may experience problems, and the operating system may not correctly complete the partition.

Kernel

- When port B is used as the console, the SPARCstation 330 hangs in diagnostic or normal mode approximately 10 seconds after self-test completes. This is a known condition that will be corrected with a new (3.0) revision boot PROM.

  Workaround: Press [ESC] within the 10-second limit.

- The disk drive supplied with the SPARCstation 330 is formatted, but the label *is not* one of the default labels in the `format.dat` file. You may wish to change the label because the space allocated for the swap partition is much larger than normal operation requires (it is typically set to 80 megabytes at the factory).

- In a "sticky" directory, `rename` does not do sufficient permissions checking, instead creating a hard link.

- The Show command under `format` does not perform a correct translation from block number to a physical location on the drive (cylinder/head/sector). SCSI lacks a command to have the target drive perform a translation from block number to a physical location on the drive.

- SCSI drives which have defects are added in logical block mode. Defects that are entered with repair or added to defect list are placed into the defect list in a cylinder, head, sector fashion. Attempts to format the drive later will fail with the following message:

```
Block 3  (0/0/3), Fatal non-media error (illegal request)
```

- A time-of-day sync problem causes the system clock to advance six minutes a year.

  Workaround: Reset the time of day just after midnight Greenwich Mean Time (for example, 5:00 PM Pacific Standard Time). The easiest way to do this is to log in as `root`, execute `crontab -e`, and add a line such as the following:

```
0 17 * * * /bin/date -a 1
```

  The command shown is for Pacific Standard Time. You will need to adjust the hour for other time zones. For example, for systems running under Eastern Standard Time, the command is:

```
0 21 * * * /bin/date -a 1
```

Library

- Some `exportent` functions do not return errors correctly. `remexportent` returns 0 even if an entry is not successfully removed from the `xtab` file.

Network

- In some cases, `netstat -r` dies with a segmentation fault error.

SunLink

Diskless clients that attempt to use their CPU serial ports may hang during boot. For example, some SunLink products may be configured to use the diskless client's local CPU port.

In order to install SunLink products that contain kernel drivers on diskless clients running SunOS 4.0.3, you must edit the configuration file and move the line that describes the Ethernet device (`device ie0`) *before* the lines that describe the `zs` ports.

Change:

```
device          zs0 at obio ? csr 0x20000 flags 3 priority 3
device          zs1 at obio ? csr 0x00000 flags 0x103 priority 3
device          ie0 at obio ? csr 0xc0000 priority 3
```

To:

```
device          ie0 at obio ? csr 0xc0000 priority 3
device          zs0 at obio ? csr 0x20000 flags 3 priority 3
device          zs1 at obio ? csr 0x00000 flags 0x103 priority 3
```

SunView

- Calling `set_cursor` may generate a canvas repaint event, thus causing an extra screen refresh.
- Lockscreen is in inverse-video mode with `suntools -overlay_only` on Sun-3/80.

Utilities

- If the terminal driver has been set to expand tabs to spaces on output (using `stty -tabs`), `more(1)` produces incorrect output when used with the `-c` switch (a leading tab is expanded to six characters instead of eight).
- `config` will not define multiple swap partitions.
- The program `finger(1)` does not handle new/unread mail correctly.
- `join` core dumps on lines longer than 147 characters.
- `cxref` does not work properly.
- `pstat -s` may display a negative amount of reserved swap space.

Sunupgrade

- `Sunupgrade` adds upgraded software for categories that were not originally installed on the system.

The criteria that `sunupgrade` uses to determine whether an optional software category is installed on a system is sometimes incorrect. In particular, if a mount point has been created to NFS mount a category of software from a server (for example, `/usr/share/man`), `sunupgrade` misinterprets the directory's presence to mean that the optional software exists on the system being upgraded. As a consequence, software may be added to a system when it should not be added.

These are the categories most likely to cause problems:

- Sys; upgraded if the directory `/usr/share/sys` exists.
- User_Diag; upgraded if the directory `/usr/diag` exists.
- System_V; upgraded if the file `/usr/5lib/libc.a` exists or if the directory `/usr/5bin` exists.
- Manual; upgraded if the directory `/usr/share/man` exists.
- Games; upgraded if the directory `/usr/games` exists.

One of two methods may be used to correct the problem:

1. Unmount and remove or rename the mount point before running `sunupgrade` , then remake the mount point after `sunupgrade` is complete.
2. Edit the scripts `/usr/etc/upgrade/extract_stand` and `/usr/etc/upgrade/extract_client` in the miniroot before running `sunupgrade`. Either change the directory tested to one deeper in the hierarchy than the mount point, or simply change it to a bogus name if you know that you don't want the category upgraded.

This is a particularly difficult problem for those workstations that have little disk space. The addition of unexpected software may cause a partition (most likely `/usr`) to fill up while `sunupgrade` is running.

- `Sunupgrade` can be confused by directory names which include the string `sun`.

When `sunupgrade` attempts to determine what workstation architectures are supported on a server it can be misled by certain entries in the `/export/exec` directory. Specifically, any subdirectory of `/export/exec` whose name contains the string *sun* is assumed to be a software architecture. For example, directories named `/export/exec/sunlink`, `/export/exec/sundesk` and `/export/exec/medisun` will all confuse sunupgrade. To avoid this problem, rename such directories before executing `sunupgrade`, then return them to their intended names after `sunupgrade` is completed. For example, the directory `/export/exec/sundesk` could be temporarily renamed `/export/exec/SUNdesk`.

- Dataless client upgrades will fail.

If you are upgrading a dataless client workstation please make the following patch after booting the miniroot but before executing `sunupgrade`:

```
# cd /usr/etc/upgrade
# ed extract_clntroot
3118
34
    clientarch=archtype
s/archtype/${archtype}/
p
    clientarch=${archtype}
w
3121
q
# sync
# cd /
```

- `Sunupgrade` sometimes uses "no-rewind" mode when it should not.

When running `sunupgrade` in any of the following circumstances please explicitly inhibit no-rewind operation by executing **`sunupgrade -n`**.

- When upgrading from a 1/2" tape drive, whether local or remote.
- When upgrading from a remote tape drive when the tapehost is running a SunOS release older than SunOS 4.0.3.

Security Hole

A security hole has been discovered in all versions of the SunOS. An immediate workaround which closes the security hole follows.

Execute:

```
# cd /bin
# ls -lg wall
-rwxr-sr-x  1 root     tty          5168 Apr 24 18:23 wall*
# chown nobody wall
# chmod u+s wall
# ls -lg wall
-rwsr-sr-x  1 nobody   tty          5168 Apr 24 18:23 wall*
#
```

In addition, on systems running SunOS 4.0 and later, edit `/etc/inetd.conf`, changing this line:

```
walld/1         dgram   rpc/udp wait root /usr/etc/rpc.rwalld rpc.rwalld
```

to:

```
walld/1         dgram   rpc/udp wait nobody /usr/etc/rpc.rwalld rpc.rwalld
```

This workaround reduces the functionality of `/bin/wall` because the root user can no longer send messages to users who have set "mesg n". The problem will be fixed in the next release of SunOS.

Changing the Sun Logo

The original *PROM User's Manual Addenda and Errata* (shipped with SunOS 4.0.3 software) shows that entering the value **6** in EEPROM location **020** *when a CG6 board is installed* results in a 3-dimensional logo display during power-up.

The EEPROM location was changed *after* the addenda was printed. Consequently, the original Read This First document, also shipped with SunOS 4.0.3, contained the new information: A **6** must be written to EEPROM location **18F** in order to display a 3-dimensional logo when using a CG6 board.

The EEPROM locations shown in the table below are valid **only for systems with a Revision 3.0 Boot PROM**. The table that follows shows what hexadecimal values in EEPROM addresses 020 and 18F result in what type of banner and logo. Note that a **12** in location 020 causes the boot program to look for text in locations 068 through 0B7. If zeroes are in that location and you have specified a custom banner with a 12 in location 020, the first line of the power-up display will disappear the next time you power-up.

You may use the SunOS `eeprom` command to specify a custom banner. To do so, become super-user and enter:

```
%su
enter super-user password
#eeprom custom_logo=true   (actually means custom_banner)
#eeprom banner="my new banner string"   (Don't forget the double quotes!)
#exit
%
```

```
%su
enter super-user password
#eeprom custom_logo=true   (actually means custom_banner)
#eeprom banner="my new banner string"   (Don't forget the double quotes!)
#exit
%
```

Now, use a command such as `/etc/halt` and then power-cycle your system, and your new banner should display when you power-up. Note that the `eeprom` command does not provide for changing the bit-mapped logo.

In addition, as indicated on the table that follows, if you enter a 12 in location 020 and then enter 0 or 6 in location 18F, the Sun logo will disappear and NO LOGO will be displayed on power-up.

If you enter a 12 in both locations 020 and 18F, you will be expected to place a string of custom banner text in locations 068 through 0B7, and a bit-mapped graphic in locations 290 through 48F. If zeroes are in those locations, the next time you power up, NO LOGO will appear and the first line of the power-up banner will disappear.

Banner Location 020 Value	***Logo Location 18F Value***	***Logo Type***	***Power-Up Banner Type***
0	0	b/w Sun	Sun
0	6	Color 3D Sun For CG6 Only	Sun
0	12	Custom	Sun
12	0	No Logo	Custom
12	6	No Logo	Custom
12	12	Custom	Custom

NOTE In location 020, any value other than **12** *is treated as a zero.*

In location 18F, any value other than a **6** *or* **12** *is treated as a zero, and the 6 only affects systems that have CG6 boards installed. For all other systems, a 6 in location 18F is treated as a zero.*

Here is an example of a Sun power-up display:

```
Sun Workstation, Model Sun-3/400 Series.
ROM Rev 3.0 12MB memory installed, Serial #128.
Ethernet address 1:2:30:4:55:66, Host ID 12345678.
```

The "Sun Workstation, Model ....." line and the Sun Logo are the only parts of the power-up display affected by EEPROM parameters.

Distribution Tape Layout

The following table is representative of the files contained on Upgrade SunOS 4.0.3 tape set.

To display a list of the exact files and file sizes that are contained on your distribution tapes, see the next page.

Upgrade SunOS 4.0.3 Tape—Sun-4 1/2""				
Tape/ File	Name	Description	Size	Format
1/0	boot	A general-purpose bootstrap program.	49152	image
1/1	XDRTOC	Table of contents in `xdr`(3N) format.	4096	toc
1/2	copy	Standalone copy.	49664	image
1/3	mini-root	An image of a mini-version of SunOS.	6154240	image
1/4	munix	Memory UNIX.	1040896	image
1/5	munixfs	The MUNIX initialization file.	2105344	image
1/6	root	The complete root file system for SunOS.	1228800	tar
1/7	usr	Required `/usr` files.	9512960	tar
1/8	Kvm	Kernel-executable files.	3143680	tar
1/9	Install	Installation and system administration tools.	983040	tar
1/10	Sys	`/usr/share/sys` files for making custom kernels.	1853440	tar
1/11	Networking	Networking tools and programs.	317440	tar
1/12	Debugging	Debugging tools.	4157440	tar
1/13	SunView_Users	SunWindows for users.	1198080	tar
1/14	SunView_Programmers	SunWindows files for programmers.	1372160	tar
1/15	SunView_Demo	SunWindows demo programs source.	51200	tar
1/16	Text	Text files.	624640	tar
1/17	User_Diag	Sundiag.	4055040	tar
1/18	SunCore	SunCore, SunCGI, plot(1), plot(3x)	1474560	tar
1/19	uucp	`uucp` files.	61440	tar
1/20	System_V	System V compatibility files.	3952640	tar
1/21	Manual	On-line manual pages.	71680	tar
1/22	Demo	Graphics demos with graphics processor source.	256000	tar
1/23	Games	Game programs.	1372160	tar
1/24	Versatec	Versatec raster printer/plotter support.	20480	tar
1/25	Security	C2 security support.	102400	tar
1/26	Copyright	The copyright file.	1024	image

Determining Exact Distribution Tape Information

To determine the exact files and file sizes contained on your distribution tapes, type the following commands:

```
# mt -f /dev/nrst0 asf 1
# dd if=/dev/nrst0 | /usr/etc/install/xdrtoc
```

You will receive a display similar to the following reflecting the files for your architecture type:

```
11+0 records in
11+0 records out
SunOS 4.0.3 of Thu Feb 9 18:14:00 PST 1989 from Sun Release Engineering
ARCH sun4
VOLUME 1
 Vol File              Name        Size   Type
   1    0              boot       40960   image
   1    1            XDRTOC        4096   toc
   1    2              copy       49664   image
   1    3         mini-root     6246400   image
   1    4             munix      958976   image
   1    5           munixfs     1638400   image
   1    6              root     1228800   tar
   1    7               usr    10649600   tar
   1    8               Sys     9625600   tar
   1    9         Copyright        1024   image
   2    0              boot       40960   image
   2    1            XDRTOC        4096   toc
   2    2        Networking      409600   tar
   2    3         Debugging     4198400   tar
   2    4     SunView_Users     1228800   tar
   2    5 SunView_Programmers  1433600   tar
   2    6      SunView_Demo      102400   tar
   2    7           Install      921600   tar
   2    8         User_Diag     3788800   tar
   2    9           SunCore     1433600   tar
   2   10              uucp      102400   tar
   2   11          System_V    12492800   tar
   2   12            Manual      102400   tar
   2   13              Demo      204800   tar
   2   16          Security      102400   tar
   2   17         Copyright        1024   image
```

Extracting Information on Individual Software Category Files

To extract information on individual files that comprise a software category, use the following procedure:

1. Load the distribution tape which contains the desired software category.
2. Skip to the correct file.
3. Use `tar` to extract the table of contents.

For example, to see the files included in the `uucp` category, referring to the tape table of contents above and assuming 1/4″ tape:

1. Mount tape 2 of the distribution.
2. Execute the following:

```
# mt -f /dev/nrst0 asf 10
# tar tvf /dev/nrsto
rwxrwxr-x  4/10      0 Feb   9  14:46 1989 ./lib/uucp/
rwx------  4/10    648 Feb   3  14:46 1989 ./lib/uucp/uuck
--x------  4/10  16384 Feb   9  14:46 1989 ./lib/uucp/uusub
--s--x--x  4/10  32768 Feb   9  14:46 1989 ./lib/uucp/uuxqt
```

Configuring The System Logging Daemon

Since SunOS 4.0 first shipped there has been confusion concerning the configuration of the system logging daemon `syslogd`. This confusion was heightened by the existence of a bug (1010651: syslogd fails to define loghost name, causes syslog race) in the initialization code of `syslogd`. This confusion has not entirely cleared despite the repair of the bug in SunOS 4.0.3.

Upon start up (and whenever it receives a HUP signal) `syslogd` reads the configuration file `/etc/syslog.conf` to determine the proper disposition of various types of system messages. Here are some sample scenarios and the means of implementing them. (The examples assume that you are running SunOS 4.0.3.)

- If you wish messages to be logged to a centralized `loghost` machine and you are running YP simply use the default configuration file. Messages will be logged to that single system in your YP domain with the name `loghost`. To see which machine in your domain is the `loghost` execute the following:

```
# ypmatch loghost hosts
129.141.5.4     central mailhost loghost
```

If you are not running YP edit your `/etc/hosts` file to assign the alternate name `loghost` to the system you wish your messages to be logged to. The name `loghost` should be defined only once in your `/etc/hosts` file.

- If you wish messages to be logged to a system other than your own that is **not** defined as the `loghost` (for this example, the system `altlog`) edit `/etc/syslog.conf` and replace each occurrence of `@loghost` with `@altlog`.
- Finally, if you wish to log messages on your local system insert the line

```
define(LOGHOST, 1)
```

as the first line in `/etc/syslog.conf`.

SunCGI and SunCore End of Life

The two bundled graphics products, SunCGI and SunCore, are being phased out as announced with the introduction of SunOS 4.0.

In general, the functionality of SunCGI can be found in SunGKS, while the functionality of SunCore can be found in SunPHIGS. It is recommended that all new development requiring a graphics package be based on either SunGKS or SunPHIGS. Existing applications should be ported to either SunGKS or SunPHIGS as soon as possible.

The last shipment of both SunCGI and SunCore will be SunOS 4.0.3. With the next release of SunOS, the libraries will be moved to the `/usr/old` directory and become unsupported. That release will also contain the final set of bug fixes for both of these library products.

The level of SunCGI and SunCore support during this transitional period is outlined below:

1. Neither SunCGI nor SunCore will be ported to any new systems or frame buffers. The following frame buffers that are offered in this release will not be supported:

   CG6 P4 graphics accelerator
   CG8 24-bit P4-bus frame buffer

2. Only very serious bugs will be fixed, and no new features or enhancements will be added.
3. The level of AnswerCenter support provided will also be reduced over time as follows:

   - At 4.0.3 and before the next SunOS release

     Since the products are being phased out, no support will be given for new application development. Questions for continuing development projects will be answered. Bug reports will be accepted only for very serious problems.

   - At the SunOS release following 4.0.3

     AnswerCenter support for both SunCGI and SunCore will be stopped except for questions about porting to SunGKS and SunPHIGS. Bug reports on SunCGI and SunCore will no longer be accepted. The AnswerCenter will continue to support both SunGKS and SunPHIGS.

4. After the final release of SunCGI and SunCore, customers may purchase SunCore or SunCGI source code from the Consulting Services group. The price of a source tape, for either SunCore or SunCGI, is $400. Customers may also purchase consulting time on the standard time-and-materials basis for any additional help they need. The telephone number for Consulting Services is (415) 366-2438.

Documentation Errata

Installing the SunOS, 4.0.3

The following change pages for the SunOS 4.0.3 installation manual are appended to this document:

- Pages 49 and 50 are replaced.
- Pages 59 through 62 are replaced.

Replace the appropriate pages with these new pages.

SunOS 4.0.3, Release Manual

The following change pages for the *SunOS 4.0.3 Release Manual (800-3815-11)* are appended to this document:

- Pages 41 through 46 are replaced.

Replace the appropriate pages in your SunOS 4.0.3 Release Manual.

```
Sun Workstation, model_type, keyboard_type
ROM Rev N, some_number_MBytes memory installed
Serial #some_number, Ethernet address xx:xx:xx:xx:xx:xx
Auto-boot in progress . . .
L1-a
(or appropriate abort sequence)
Abort at some_address
>
```

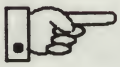
See *Chapter 3* in this manual for the appropriate abort sequence for your system.

Step 2: Stopping Auto-boot

Stop the auto-boot immediately by typing the appropriate abort sequence for your machine (abort sequences are described in the previous chapter). When you abort the auto-boot, you return control to the monitor, and it displays its prompt (>).

Step 3: Mounting the Tape

Mount tape 1 of your full installation tape set.



Before mounting the tape, check your tape drive hardware manual. With some tape drives, if you insert the tape incorrectly, it becomes jammed and is difficult to remove.

If you have any questions about your tape drive, see the subsystems chapter in the *Hardware Installation* manual for your machine.

Remember to substitute the proper device abbreviation for your tape controller for *tape*. The following table provides a list of possible tape device abbreviations.

Table 4-1 *Tape Controller Abbreviations*

Abbreviation	*Tape Controller*
ar	Archive 1/4"
st	SCSI
mt	Tapemaster 1/2"
xt	Xylogics 472 1/2"

For more information on device abbreviations or conventions, see the *SunOS Device Names* section in Chapter 2.

To Load the Bootstrap Program:

To install SunOS using a local tape drive, boot the bootstrap program from the tape. The following example uses the *st0* tape device.

```
>b st(0,0,0)
```

When you type the command, the monitor echoes it back to you. If you load the boot program from *st*, you receive the following display:

```
>b st(0,0,0)
Boot: st(0,0,0)
Boot:
```

4.4. Formatting the Disk

`format` is the program used to format a disk, change `root` and `swap` partition sizes, label, repair, and analyze a disk. `format` should be run *before* starting `suninstall`. If your target system disk has been corrupted or if it was purchased from a third party vendor, it is particularly necessary for you to format and label the disk before installing SunOS.

If your disk was purchased from Sun, it was formatted and labelled at the factory. However, it is still recommended that you reformat the entire drive as it insures that any head movement that occurred during shipping will not affect the performance of the new disk.

This section covers the covers the following procedures for formatting and labelling a disk. These procedures format the disk according to Sun default standards.

1. Copying `MUNIX`.
2. Generating and saving the defect list.
3. Running `format`.
4. Labelling the Disk

To change the `root` partition, or decrease the size of the `swap` partition, you need to create a partition table and relabel the disk using `format` before copying the miniroot. For information on how to create a partition table and change `root` and `swap` space allocations, see the *Advanced Installation Issues* chapter in this manual.

Partitions other than `root` and `swap` should only be altered in *suninstall*.

Before You Begin

If you are re-installing a system that is already running SunOS, you do not need to run `format`.

Step 1: Halting the System

Halt your system using the following method:

```
# /etc/halt
```

Step 2: Booting the copy Program

Boot the standalone `copy` program from tape (`st0`) using the following method.

```
>b st(0,0,0)
Boot:st(0,0,0)
Boot:st(0,0,2)
Size:some_number+some_number+some_number bytes
Standalone Copy
```

The '2' in (0,0,2) is the file on the tape that is being copied.

Step 3: Copying the Miniroot

Use the `copy` program to copy the miniroot from the distribution tape to your disk.

Refer to the following table for the proper number sequence for the **To:** disk command line:

Disk Device	*To: disk Command Line*
sd0	sd(0,0,1)
sd1	sd(0,1,1)
sd2	sd(0,8,1)
sd3	sd(0,9,1)
sd4	sd(0,10,1)
sd6	sd(0,18,1)

```
From:st(0,0,3)
To:sd(0,0,1)
```

The '3' in (0,0,3) is the file on the tape that is being copied.

The '1' in (0,0,1) is the partition on the disk where the file is being copied to.

At the end of the copy, the `copy` program returns control to the bootstrap program:

```
Copy completed    some_number bytes
Boot:
```

4.6. Booting the Miniroot

Now that there is an operable miniroot on the disk, the bootstrap program can boot the miniroot, `vmunix`, from the disk.

In the following example, *sd0* is the disk device being installed.

If you are installing a SPARCsystem 300 or a Sun-3/80, your internal disk device is *sd6*. See, *SunOS Device Names* in Chapter 2 for a selection of possible device names.

Boot Miniroot Example:

The following example shows you how to boot vmunix using the boot process.

Booting the miniroot

Refer to the following table for the proper sequence that relates to your disk device:

Disk Device	*Command Line Sequence*
sd0	sd(0,0,1)
sd1	sd(0,1,1)
sd2	sd(0,8,1)
sd3	sd(0,9,1)
sd4	sd(0,10,1)
sd6	sd(0,18,1)

```
Boot:sd(0,0,1)vmunix
```

You can specify the **-a** argument after **vmunix** if you want to specify the location of the `root` and `swap` partitions. Without the use of the **-a** argument, the Sun standard default is used.

```
Boot: sd(0,0,1)vmunix
Size: some_number+some_number+some_number bytes
SunOS Release 4.0.3 (MUNIX)#1: Thurs Mar 2 20:54:17 PST 1989
Copyright(c) 1989 by Sun Microsystems, Inc.
mem=4096k (0X400000)
avail mem = 3186688
Ethernet address = 8:0:20:0:7a:55
        .
        .
     disk and tape drive information
        .
        .
     ethernet controller information
```

The '1' in (0,0,1) means booting from partition 1, which is actually the second partition or swap partition.

Designating the `root` *Filesystem*

When the miniroot is invoked, it displays some messages about the configuration of the system on which it is running, and displays the root filesystem location and type.

```
root on rd0a fstype 4.2
```

4.2 is a UNIX filesystem structure type. In SunOS 4.0, this is the only filesystem type available for the root filesystem.

Designating the Swap Partition

You will receive the following display that tells you the location of the swap filesystem and its type.

```
swap on ns0a fstype spec size 1216k
dump on ns0a fstype spec
```

spec is a special type of partition used for the swap space. It does not have the structure of the partition used for the 4.2 filesystem and allows for more flexibility.

Now you are ready to run *suninstall*. Go to the next chapter for a complete explanation of *suninstall*. Read the next chapter carefully before you continue with the installation.

4

Performance Tips

Implementing the following recommendations will not solve every performance problem, but many problems can be eliminated by following these suggestions.

4.1. Routing

Workstations with only one Ethernet interface do not need to do dynamic routing with `in.routed`. Instead, you can make them route statically by commenting (add a number sign # in column 1) the following lines in `/etc/rc.local`:

```
#if [ -f /usr/etc/in.routed ]; then
#   in.routed;        (echo -n ' routed')   >/dev/console
#fi
```

Routing table entries can still be added or modified by the kernel as a result of ICMP redirect messages.

Diskless clients have a route provided automatically by the server. On other workstations, a command of this form can be added to `rc.local` (*router* is the hostname of an IP router—also called a gateway—on the local network);

```
/usr/etc/route add default router 1
```

This action frees up both the pages used by `in.routed` and most of the memory allocated for routing table entries.

4.2. Sendmail

Receiving mail on a diskless workstation typically causes a significant amount of paging, due not only to the creation of `sendmail` and `/bin/mail` processes, but also to alias resolution and access over the network to the mailbox on the server.

Recommendation: Have each client mount its `spool` directory via secure NFS, change the YP alias map to direct users' mail to their servers, and do not run `sendmail` on the clients. For example, add a line like the following to each client `/etc/fstab`:

```
server:/var/spool/mail /var/spool/mail
        nfs rw,bg,hard,intr,secure 0 0
```

Export `/var/spool/mail` on the server using the *secure* option. Do not forget to run `exportfs`. Change or create aliases in `/etc/aliases` on the YP master or provide aliases in this form:

```
user: user@server
```

Do this for all users who would otherwise receive mail on the clients, and remake the YP alias map with `cd /var/yp; make aliases`. Comment these lines in each client's `/etc/rc.local` file as shown below and reboot the clients:

```
#if [ -f /usr/lib/sendmail -a -f /etc/sendmail.cf ]; then
#    (cd /var/spool/mqueue; rm -f nf* lf*)
#    /usr/lib/sendmail -bd -qlh;  (echo -n ' sendmail')>
     /dev/console
#fi
```

An interesting and positive side-effect of this change is that a user can receive mail even if the client workstation is down. This change is also useful in environments where users wish to be able to log in to any machine or a cluster and read their mail.

4.3. Accounting

Do not enable process accounting. If accounting is not configured into the kernel (`options SYSACCT`), or the file `/var/adm/acct` does not exist at boot time, accounting is not enabled (see `/etc/rc`).

4.4. Do Not Start Unnecessary Server Processes

Workstations typically require only `portmap`, `ypbind`, `biod` (there are four of them), `syslogd`, `update`, `inetd`, and `lpd`. Add `keyserv` if you use secure NFS and `sendmail` if you do not implement the `sendmail` strategy described earlier.

4.5. Miscellaneous

- Do not enable file-system quotas. (By default, quotas are not enabled.) Replacing `/usr/ucb/quota` with `/usr/bin/true` will prevent possible delays at login time due to calls to `rpc.rquotad` on each NFS server from which you have a file system mounted.
- Use the default SunView background, and do not use retained windows.
- Do not enable `in.rwhod`.

4.6. Minimizing Kernel Size

Because the default kernel (GENERIC) can handle almost any conceivable configuration or situation, it contains much more than you are likely to need. Unless you will be using one of the preconfigured small kernels, you should follow these recommendations to reduce the size of your kernel and to improve system performance (by reducing paging and swapping).

1. **Do not run the GENERIC kernel except to configure a smaller one!**
2. Edit the kernel configuration file as follows:

   Remove all unnecessary entries from the kernel configuration file. For example, the following lines can be removed from DL50 in `/usr/sys/sun3/conf`:

```
options         CRYPT        (unless you use secure NFS)

pseudo-device   clone
pseudo-device   snit
pseudo-device   pf
pseudo-device   nbuf
device          des0 at obio ?  csr 0x1c0000
```

   Note: Streams NIT (`snit` above) is needed by `etherfind`. To run `etherfind`, boot another kernel or run it on the server.

3. Reduce "maxusers" to three if it is practical to do so.

```
maxusers        3
```

4. Change the following pseudo-device lines from their default values to the values shown:

```
pseudo-device  dtop1
pseudo-device  ms1
pseudo-device  kb1
```

5. Reduce streams buffers allocation.

   The default allocation of streams buffers is overly generous. Follow these steps to make a kernel with smaller allocations:

   a. Run `config` using your modified configuration file.

   b. In `/usr/share/sys/sun3/`*KERNELNAME*`/param.c`, modify the default values as shown:

```
#define  NBLK2048      4
#define  NBLK1024      4
#define  NBLK512       4
#define  NBLK256      16
#define  NBLK128      64
#define  NBLK64       64
#define  NBLK16       64
#define  NBLK4        64

#define  NSTREAM      20
#define  NMUXLINK     37

#define  NSTREVENT    64
```

Larger allocations may be required in some environments. In some circumstances, running out of mblocks can deadlock the system. Check your usage with `netstat -m`.

c. Run `make`.

6. Ethernet buffers

If you have an `le` Ethernet interface (Sun-3/50, -3/60, -3/80, or SPARCstation 330) reduce the number of Ethernet buffers from the default values:

```
# adb -w vmunix
_le_nrmdp2?W 3
_le_nrbufs?W A
$q
#
```

If you have an `ie` Ethernet interface:

```
# adb -w vmunix
_ie_tbufs?W 1
_ie_rbds?W 6
_ie_rfds?W 5
_ie_rbufs?W 9
$q
#
```

7. UFS (UNIX File System) buffers:

If you have a disk, you can reduce the number of buffers allocated to the UFS buffer cache:

```
# adb -w vmunix
_nbuf?W 6
$q
#
```

sun microsystems

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